

CLAIMS

1 A zoom lens composed of plural groups and adapted to change group spacing or spacings to thereby perform magnification changing or adjusting operation,

the zoom lens comprising:

a first group at least including a reflection member for bending or folding the optical axis and a negative group at an object side relative to the reflection member, and fixed during magnification changing or adjusting operation;

a second group movably provided during magnification changing or adjusting operation at an image side of the first group and having negative refractive power; and

a light quantity adjustment member fixed during magnification changing or adjusting operation,

wherein the reflection member is withdrawn at the time of sinking lens barrel, and the negative group of the first groups is accommodated into a space thus defined.

2 The zoom lens according to claim 1,

wherein lens group or groups of the object side relative to the reflection member of the first group satisfy the following formula (1).

$$2.0 < |f_a/f_w| < 6.0 \quad \cdots (1)$$

In the above formula,

fa: focal length of lens group of the object side relative
to the reflection member of the first group, and

fw: focal length at broad angle end.

3 An image pick-up device comprising:

a zoom lens composed of plural groups and adapted to change group spacing or spacings to thereby perform magnification changing or adjusting operation; and

an image pick-up device for converting an optical image which has been formed by the zoom lens into an electric signal,

the zoom lens at least including: a first group at least including a reflection member for bending or folding the optical axis and a negative group at an object side relative to the reflection member, and fixed during magnification changing or adjusting operation; a second group movably provided during magnification changing or adjusting operation at an image side of the first group and having negative refractive power; and a light quantity adjustment member fixed during magnification changing or adjusting operation, wherein the reflection member is withdrawn at the time of sinking lens barrel so that the negative group of the first group is accommodated into a space thus defined.

4 The image pick-up apparatus according to claim 3,

wherein lens group or groups of the object side relative to the reflection member of the first group satisfy the following formula (2).

$$2.0 < |f_a/f_w| < 6.0 \quad \cdots (2)$$

In the above formula,

f_a : focal length of lens group of the object side relative
to the reflection member of the first group, and

f_w : focal length at broad angle end.